

d his

(FILE 'HOME' ENTERED AT 11:15:47 ON 18 DEC 1999)

FILE 'REGISTRY' ENTERED AT 11:15:52 ON 18 DEC 1999

L1 97 (0<CU<5 AND 0<MG<6 AND 0<LI<1 AND 50<AL) /MAC

FILE 'HCA' ENTERED AT 11:16:30 ON 18 DEC 1999

L2 130 L1
L3 4476 (ALUMINUM OR AL) AND (COPPER OR CU) AND (LITHIUM OR LI) AND

(MA 63 L2 AND L3
L4 SELECT L4 1- IPC

L5 371029 E1-E28

L6 504 L5 AND L3
L7 0 (ALUMINUM OR AL) (1A) (BASE? OR ALLOY OR BALANC? OR REMAIN? OR

RE 125719 (ALUMINUM OR AL) (1A) (BASE? OR ALLOY OR BALANC? OR REMAIN? OR

RE 328 L6 AND L8
L10 206 L9 AND (CR OR V OR TI OR ZR) AND (MN OR NI OR FE OR HF)

L11 181 L10 NOT L4

L12 165 L11 AND (ZN OR AG OR SI)
E RIOJA ROBERTO/IN,AU

L13 14 E5-6
E STALEY JAMES/IN,AU

L14 35 E8-E9
E BRAY GARY/AU,IN

L15 9 E5-E7

L16 56 L13 OR L14 OR L15
L17 17 L16 AND L8 AND (CR OR V OR TI OR ZR) AND (MN OR NI OR FE OR

HF)
L18 10 L17 NOT (L4 OR L12)

AN 131:160372 HCA
 TI High-strength **aluminum-magnesium** alloys for
 application in welded construction
 IN Haszler, Alfred Johann Peter; Sampath, Desikan
 PA Hoogovens Aluminium Walzprodukte G.m.b.H., Germany
 SO PCT Int. Appl., 20 PP.
 CODEN: PIXXD2
 DT Patent
 LA English
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9942627	A1	19990826	WO 1999-EP1011	19990218
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ,				
TM	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
PRAI	EP 1998-200560		19980220		
AB	The Al-Mg alloys suitable for extrusions or rolled strip contain Mg >3.0 to 4.5 (esp. 3.5-4.5), Mn 0.4-1.2, Zn 0.4-1.7, Zr 0.05-0.25, Cr .1toreq.0.3, Ti .1toreq.0.2, V .1toreq.0.2, Li .1toreq.0.5, Sc .1toreq.0.5, Fe .1toreq.0.5, Si .1toreq.0.5, Cu .1toreq.0.15, and Ag .1toreq.0.4% with impurities .1toreq.0.05 each and .1toreq.0.15% total. The Al-Mg alloy is suitable for manuf. of high-strength containers or welded structural parts, esp. for operation near 80-100.degree.. The alloy ingot is typically preheated at 300-530.degree. to decrease segregation, hot rolled, and optionally finished by cold rolling, and the resulting strip is heat treated for high-strength applications and corrosion resistance. The typical alloy for manuf. of the strip 1.2 mm thick with longitudinal tensile strength of 292 MPa contains Mg 3.9, Mn 0.74, Zn 0.53, Zr 0.13, Cr 0.05, Ti 0.02, Fe 0.31, Si 0.14, and Cu 0.05%. The alloy strength and ductility are comparable to those of the low-Zn AA				
5083	Al-alloy strip susceptible to sensitized and intergranular corrosion.				

AN 130:240658 HCA
 TI **Aluminum** alloys for extrusion and their production method
 including casting process with element addition
 IN Kikuchi, Masao; Saga, Makoto
 PA Nippon Steel Corp., Japan
 SO Jpn. Kokai Tokkyo Koho, 13 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1
 PATENT NO. KIND DATE APPLICATION NO. DATE

 PI JP 11061312 A2 19990305 JP 1997-232545 19970828
 AB The **Al** alloys contain Si .1toreq.1.2, Fe .1toreq.1.5, **Cu**
 .1toreq.0.50, Mn .1toreq.1.5, **Mg** 2.0-8.0, Cr .1toreq.0.35, Zn
 .1toreq.0.50, and Ti .1toreq.0.20% and have no. of crystals having max.
 .1toreq.0.50, and Ti .1toreq.0.20% and have no. of crystals having max.
 diam. .gtoreq.40 .mu.m .1toreq.200/mm² in cross section of billets for
 extrusion and no. of crystals having ratio of (max. diam.)/(min. diam.)
 .gtoreq.5.0 .1toreq.100/mm². Alternatively, the alloys contain (a)
 0.2-1.5% each of Si and **Mg** or (b) **Cu** .1toreq.3.0,
Mg 0.2-3.0, and Zn 1.0-8.0% instead of the above ratio of each
 element. In the manuf. of the alloys by melting, casting, and soaking to
 form billets, 0.005-0.3% in total of Na, Sr, Sb, Ca, Te, Ba, **Li**,
 K, Bi, P, As, and/or Se is added during the casting process. The alloys
 have good extrusion property, mech. properties, corrosion resistance, and
 secondary workability even though they are manufd. by recycling scraps as
 raw materials.

AN 130:240657 HCA
TI **Aluminum** alloy strips and their production for automobile body

panels

IN Kikuchi, Masao; Takada, Takeshi

PA Nippon Steel Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
------------	------	------	-----------------	------

PI JP 11061311	A2	19990305	JP 1997-232526	19970828
----------------	----	----------	----------------	----------

AB The **A1** alloy strips contain Si .ltoreq.1.2, Fe .ltoreq.1.5, Cu .ltoreq.0.50, Mn .ltoreq.0.80, Mg 2.0-8.0, Cr .ltoreq.0.35, Zn .ltoreq.0.50, and Ti .ltoreq.0.20% and have no. of crystals having max. diam. .gtoreq.10 .mu.m .ltoreq.300/mm² in cross section of rolling direction and no. of crystals having ratio of (max. diam)/(min. diam.) .gtoreq.3.5 .ltoreq.100/mm². In the manuf. of the alloy strips, 0.005-0.3% in total of Na, Sr, Sb, Ca, Te, Ba, Li, K, Bi, P, As, and/or Se is added during casting process. The strips have improved moldability and corrosion resistance even though they are manufd.

by recycling scraps as raw materials.

AN 104:23136 HCA
 TI **Aluminum-lithium alloys**
 IN Sawtell, Ralph R.; Bretz, Philip E.; Hunt, Warren H.
 PA Aluminum Co. of America, USA
 SO Eur. Pat. Appl., 23 pp.
 CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 8

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 157600	A2	19851009	EP 1985-302169	19850328
	EP 157600	A3	19870916		
	EP 157600	B1	19920701		
	R: CH, DE, FR, GB, IT, LI, NL, SE				
	US 4648913	A	19870310	US 1984-594344	19840329
	AU 8538094	A1	19851003	AU 1985-38094	19850125
	AU 573683	B2	19880616		
	CA 1228490	A1	19871027	CA 1985-475903	19850307
	NO 8501267	A	19850930	NO 1985-1267	19850328
	BR 8501422	A	19851126	BR 1985-1422	19850328
	JP 60221543	A2	19851106	JP 1985-66407	19850329
	US 4897126	A	19900130	US 1988-213722	19880630
	US 5135713	A	19920804	US 1990-588410	19900926
PRAI	US 1984-594344	19840329			
	US 1984-685731	19841224			
	US 1988-149802	19880128			
	US 1988-172506	19880324			
AB	High toughness in combination with tensile strength is obtained in aircraft alloys contg. Li 0.5-4, Mg 0-5.0, Cu 0-5.0, Zr 0-1.0, Mn 0-2.0, Zn 0-7, Fe <0.5, and Si <0.5%. The wrought				
bar	or strip is soln.-treated, quenched, stretched >3%, and aged at 150-400.degree.F. Tensile strength of 50-85 kpsi is typically achieved with fracture toughness 25-75 kpsi-in0.5. Thus, Al alloy ingot contg. Li 1.73, Cu 2.63, and Zr 0.12% was homogenized 24 h at 1000.degree.F, and hot-rolled into plates 1 in. thick. The plate was soln. heat treated 1 h at 1025.degree.F, quenched in water at 70.degree.F, stretched 2 or 6%, and aged at 325 or 375.degree.F. Tensile strength and fracture toughness were higher after stretching to 6%, compared with 2%.				

Examiner's Copy

AN 107:119640 HCA
TI **Aluminum-lithium** alloys and method of making the same
IN Cho, Chul Won
PA Aluminum Co. of America, USA
SO PCT Int. Appl., 46 pp.
CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 8

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 8703011	A1	19870521	WO 1986-US2545	19861119
	W: AU, BR, JP, NO				
	US 4806174	A	19890221	US 1985-793273	19851119
	AU 8768381	A1	19870602	AU 1987-68381	19861119
	BR 8606987	A	19871201	BR 1986-6987	19861119
	EP 247181	A1	19871202	EP 1987-900418	19861119
	EP 247181	B1	19911002		
	R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE				
	JP 63501883	T2	19880728	JP 1987-500396	19861119
	CA 1283565	A1	19910430	CA 1986-523324	19861119
	NO 8702996	A	19870917	NO 1987-2996	19870717
PRAI	US 1985-793273		19851119		
	US 1984-594344		19840329		
	WO 1986-US2545		19861119		

AB The low-d. alloys suitable for aircraft applications contain **Li** 0.5-4.0, **Mg** 0-5.0, **Cu** <5.0, Zr 0-1.0, Mn 0-2.0, Zn 0-7.0, and Fe and Si .1toreq.0.5% each. A wrought product having an isotropic texture is manufd. by hot working into a preform without a dissoln. loss of grain-boundary ppts., followed by recrystn. of the preform and hot working for final shaping. The alloy is suitable for sheet manuf. and pptn. hardening. Thus, a cast ingot of **Al** alloy (contg. **Li** 1.73, **Cu** 2.63, and Zr 0.12%) was soaked 24 h at 1000.degree. F, and then hot-rolled into a plate (.apprx.0.25 in). The plate was soln.-treated 1 h at 1075.degree. F, quenched in water to 70.degree. F, and stretched for 2 or 6% elongation. Plate specimens were then heat-treated at 325 or 375.degree. F for artificial aging. Fracture toughness and tensile strength were improved more by stretch-forming for 6% than for 2%.

Examiner's Copy

AN 110:139903 HCA
TI **Aluminum-lithium** alloy for flat-rolled product
IN Young, Kenton P.; Bowers, Joel A.; Colvin, Edward L.; Westerlund, Robert A.
PA Aluminum Co. of America, USA
SO Eur. Pat. Appl., 6 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 281076	A1	19880907	EP 1988-103080	19880301
	EP 281076	B1	19920520		
	R: CH, DE, ES, FR, GB, IT, LI, NL, SE				
	US 4790884	A	19881213	US 1987-20600	19870302
	CA 1308630	A1	19921013	CA 1988-560077	19880229
	JP 63235454	A2	19880930	JP 1988-49453	19880302
	BR 8800903	A	19881011	BR 1988-903	19880302
PRAI	US 1987-20600		19870302		
AB	The Al-Li alloys for sheets or plates showing a good formability without Luder's line defect contain Li 0.5-4.0, Cu and Mg .1toreq.5.0 each, Zr .1toreq.1.0, Mn .1toreq.2.0, Zn .1toreq.7.0, Fe and Si .1toreq.0.5% each, and preferably .1toreq.0.35% impurities. A flat-rolled product is soln. heat treated				
and	quenched; preaged at 150-270.degree.F for >6 h; stretched without forming the Luder's line defect; and then aged to stabilize mech. properties. Thus, cast alloy ingot (contg. Li 2.3, Cu 2.7, and Zr 0.1%) was heated for 24 h at 1000.degree.F for homogenizing, hot-rolled to				
to	0.162 in. thickness, cut, and cold-rolled into strips 0.063 in. thick. The strips were heated for 60 min at 1020.degree.F, quenched in water, preaged at 230.degree.F for 100 h, and cooled in air. The strips were then stretched 1% without showing the Luder's line defect. Without the preaging treatment the stretched strips showed the defect.				

Examiner's Copy

AN 116:260506 HCA
TI Two-step aging of **aluminum-lithium** alloys
IN Rioja, Roberto J.; James, R. Steve
PA Aluminum Co. of America, USA
SQ U.S., 10 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5076859	A	19911231	US 1989-457099	19891226

AB The soln. treated articles from **Al-Li** alloys are aged in the 1st stage for 0.1-100 h at 250-415 .degree.F, and then in the 2nd stage (esp. for 1-1000 h) at 100-330 .degree.F for improved strength and fracture toughness. The heat treatment process is suitable for the **Al** alloys contg.: (a) **Li** 0.2-5.0, **Mg** 0-5.0, **Cu** .1toreq. 5.0, Ag 0-2, Zr 0-1.0, Mn 0-1.0, Zn 0-9.0, Fe .1toreq. 0.5, and/or Si .1toreq. 0.5%; or (b) **Li** 0.5-4.0, **Mg** 0.1-6.0, **Cu** .gtoreq. 0.6, Zn 0.05-12, Mn 0-0.8, Zr .1toreq. 0.15, Ag 0.05-1, Fe .1toreq. 0.5, and/or Si .1toreq. 0.5%. Thus, the strip specimens from AA 2090 alloy were aged at 300-310 .degree.F and then at 212-250 .degree.F, and showed high fracture toughness insensitive to the tensile yield strength of 72-80 kpsi. When the alloy was aged only at 325 .degree.F, the fracture toughness decreased with the higher yield strength of 70-77 kpsi.

Examiner's Copy

AN 124:295966 HCA
TI Crystallography of heterogeneous S' & T1 precipitates in double aged
Al-Cu-Mg-(Li) Alloys
AU Oezbilen, Sedat
CS Teknik Egitim Fakultesi, Gazi Univ., Ankara, Turk.
SO Turk. J. Eng. Environ. Sci. (1996), 20(2), 103-12
CODEN: TJESEC; ISSN: 1300-0160
DT Journal
LA Turkish
AB Alloys prep'd. with a chem. compn. of Al-2.11%Cu-0.93%
Mg (alloy-1) and Al-2.07%Cu-0.97%Mg
-0.87%Li (alloy-2) were subjected to homogenization,
water-quenching, natural aging for 3.15 .times. 107s & artificial aging
at 463K for 2.16 .times. 104s & 8.64 .times. 104s (double aging). Selected
samples were examd. in detail under TEM. For this purpose, bright & dark
field images together with electron diffraction patterns taken from
[001], [011], [012] & [111]Al-matrix directions were used. It was obsd. that
there was an effect of alloying elements, namely Li, Cu
, Mg on the nature & d. of lattice defects of dislocation loop
type in Al-matrix during heat treatments. In alloy-2,
Li & Cu atoms segregating on Frank & double-arc
contrast, prismatic loops cause the formation of T1 (Al₂CuLi) ppts.
during double aging; in alloys-1 & 2, Cu & Mg atoms
segregating on unfaulted & orthorhombic, prismatic dislocation loops
cause the formation of heterogeneous S' (Al₂CuMg) ppts. on these dislocation
loops during the same heat treatment.

Examiner's Copy

AN 118:85846 HCA

TI **Aluminum-lithium-zinc** alloys for extruded parts having
a low aspect ratio

IN Witters, Jeffrey J.; Cheney, Brian A.; Rioja, Roberto J.

PA Aluminum Co. of America, USA

SO PCT Int. Appl., 21 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9212269	A1	19920723	WO 1991-US9808	19911227
	W: JP				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE				
	US 5151136	A	19920929	US 1990-634901	19901227
	EP 517884	A1	19921216	EP 1992-902697	19911227
	R: DE, FR, GB				
	JP 05505854	T2	19930826	JP 1992-502886	19911227
PRAI	US 1990-634901		19901227		
	WO 1991-US9808		19911227		
AB	The Al alloys having extruded length/thickness ratio of 1-2.5 contain Li 0.2-5.0 and Zn 0.05-12.0 (esp. 0.05-1%) with Mg 0-5.0, Cu .1toreq.6.5, Zr .1toreq.1.0 Mn .1toreq.2.0, Ag .1toreq.2, Fe .1toreq.0.5, and/or Si .1toreq.0.5%. The preferred alloy				
	contains Li 1.5-3.0, Cu 2.55-2.90, Mg 0.2-2.5, Zn 0.2-11.0, Zr 0.08-0.12, Mn 0-1.0, and Fe and Si impurities .1toreq.0.1% each. The alloys optionally contain Cr, V, Sc, and/or Ti at 0.05-0.2, and/or Hf, Fe, Ni, Ag, and/or Mn at 0.05-0.6%. The starting alloy ingot can be preformed with .gtoreq.30% size redn., followed by heat				
	treatment for 1-50 h at 400-1200.degree. prior to the extrusion stage. Tensile yield strength of the extrusions is .gtoreq.60 kpsi. Thus, the extruded billet was manufd. from the alloy contg. Li 2.17, Cu 2.79, Zn 0.49, Mg 0.25, Zr 0.07, Mn 0.35, and V 0.08%. After thermomech. treatment and final aging (30 h at 310 .degree.F), tensile strength was 78 kpsi, yield point 71.2 kpsi, and elongation 6.8%. Com. AA 2091 Al alloy after the same processing showed 70 kpsi, 69.4 kpsi, and 1.6% resp.				

AN 110:139903 HCA
TI **Aluminum-lithium** alloy for flat-rolled product
IN Young, Kenton P.; Bowers, Joel A.; Colvin, Edward L.; Westerlund, Robert
A.
PA Aluminum Co. of America, USA
SO Eur. Pat. Appl., 6 pp.
CODEN: EPXXDW

DT Patent
LA English

FAN. CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 281076	Al	19880907	EP 1988-103080	19880301
	EP 281076	B1	19920520		
	R: CH, DE, ES, FR, GB, IT, LI, NL, SE				
	US 4190884	A	19881213	US 1987-20600	19870302
	CA 1308630	A1	19921013	CA 1988-560077	19880229
	JP 63235454	A2	19880930	JP 1988-49453	19880302
	BR 8800903	A	19881011	BR 1988-903	19880302

PRAI US 1987-20600 19870302

AB The **Al-Li** alloys for sheets or plates showing a good formability without Luder's line defect contain **Li** 0.5-4.0, **Cu** and **Mg** .1toreq.5.0 each, **Zr** .1toreq.1.0, **Mn** .1toreq.2.0, **Zn** .1toreq.7.0, **Fe** and **Si** .1toreq.0.5% each, and preferably .1toreq.0.35% impurities. A flat-rolled product is soln. heat treated

and quenched; preaged at 150-270.degree.F for >6 h; stretched without forming the Luder's line defect; and then aged to stabilize mech. properties. Thus, cast alloy ingot (contg. **Li** 2.3, **Cu** 2.7, and **Zr** 0.1%) was heated for 24 h at 1000.degree.F for homogenizing, hot-rolled

to 0.162 in. thickness, cut, and cold-rolled into strips 0.063 in. thick. The strips were heated for 60 min at 1020.degree.F, quenched in water, preaged at 230.degree.F for 100 h, and cooled in air. The strips were then stretched 1% without showing the Luder's line defect. Without the preaging treatment the stretched strips showed the defect.

Examiner's Copy

AN 90:126079 HCA
TI **Aluminum** alloy with improved weldability
IN Sperry, Philip R.; Mandigo, Frank N.
PA Swiss Aluminium Ltd., Switz.
SO Ger. Offen., 17 pp.
CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 2810932	A1	19781012	DE 1978-2810932	19780314
	US 4094705	A	19780613	US 1977-781718	19770328

PRAI US 1977-781718 19770328

AB High-strength formable **Al** alloy [69508-78-7] suitable for resistance welding contains **Mg** 2-4, **Li** 0.4-0.8, **Mn** 0.1-0.7, **Fe** 1toreq.0.45, **Si** 1toreq.0.45, **Cu** 1toreq.10.2, **Cr** 1toreq.0.4, **Ti** 0.1-0.2, **Zn** 1toreq.0.3, **Ni** 1toreq.0.3, **V** 0.05-0.15 and **Zr** 1toreq.0.15%. The alloy contains **Li** in solid soln. and shows higher elec. resistance than **Li**-free alloys when rolled to sheet and annealed.

Examiner's Copy

AN 116:260506 HCA
TI Two-step aging of aluminum-lithium alloys
IN Rioja, Roberto J.; James, R. Steve
PA Aluminum Co. of America, USA
SO U.S., 10 pp.
CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5076859	A	19911231	US 1989-457099	19891226

AB The soln. treated articles from Al-Li alloys are aged in the 1st stage for 0.1-100 h at 250-415 .degree.F, and then in the 2nd stage (esp. for 1-1000 h) at 100-330 .degree.F for improved strength and fracture toughness. The heat treatment process is suitable for the Al alloys contg.: (a) Li 0.2-5.0, Mg 0-5.0, Cu .ltoreq. 5.0, Ag 0-2, Zr 0-1.0, Mn 0-1.0, Zn 0-9.0, Fe .ltoreq. 0.5, and/or Si .ltoreq. 0.5%; or (b) Li 0.5-4.0, Mg 0.1-6.0, Cu .gtoreq. 0.6, Zn 0.05-12, Mn 0-0.8, Zr .ltoreq. 0.15, Ag 0.05-1, Fe .ltoreq. 0.5, and/or Si .ltoreq. 0.5%. Thus, the strip specimens from AA 2090 alloy were aged at 300-310 .degree.F and then at 212-250 .degree.F, and showed high fracture toughness insensitive to the tensile yield strength of 72-80 kpsi. When the alloy was aged only at 325 .degree.F, the fracture toughness decreased with the higher yield strength of 70-77 kpsi.

Edmund C. Conner

AN 107:119640 HCA
TI **Aluminum-lithium** alloys and method of making the same
IN Cho, Chul Won
PA Aluminum Co. of America, USA
SO PCT Int. Appl., 46 pp.
CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 8

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 8703011	A1	19870521	WO 1986-US2545	19861119
	W: AU, BR, JP, NO				
	RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE				
	US 4806174	A	19890221	US 1985-793273	19851119
	AU 8768381	A1	19870602	AU 1987-68381	19861119
	BR 8606987	A	19871201	BR 1986-6987	19861119
	EP 247181	A1	19871202	EP 1987-900418	19861119
	EP 247181	B1	19911002		
	R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE				
	JP 63501883	T2	19880728	JP 1987-500396	19861119
CA 1283565	A1	19910430	CA 1986-523324	19861119	
NO 8702996	A	19870917	NO 1987-2996	19870717	
PRAI	US 1985-793273		19851119		
	US 1984-594344		19840329		
	WO 1986-US2545		19861119		

AB The low-d. alloys suitable for aircraft applications contain **Li** 0.5-4.0, **Mg** 0-5.0, **Cu** <5.0, Zr 0-1.0, Mn 0-2.0, Zn 0-7.0, and Fe and Si <0.5% each. A wrought product having an isotropic texture is manufd. by hot working into a preform without a dissoln. loss of grain-boundary ppts., followed by recrystn. of the preform and hot working for final shaping. The alloy is suitable for sheet manuf. and pptn. hardening. Thus, a cast ingot of **Al** alloy (contg. **Li** 1.73, **Cu** 2.63, and Zr 0.12%) was soaked 24 h at 1000.degree. F, and then hot-rolled into a plate (.apprx.0.25 in). The plate was soln.-treated 1 h at 1075.degree. F, quenched in water to 70.degree. F, and stretched for 2 or 6% elongation. Plate specimens were then heat-treated at 325 or 375.degree. F for artificial aging. Fracture toughness and tensile strength were improved more by stretch-forming for 6% than for 2%.

F... ... Cor

AN 104:23136 HCA
TI **Aluminum-lithium** alloys
IN Sawtell, Ralph R.; Bretz, Philip E.; Hunt, Warren H.
PA Aluminum Co. of America, USA
SO Eur. Pat. Appl., 23 pp.
CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 8

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 157600	A2	19851009	EP 1985-302169	19850328
	EP 157600	A3	19870916		
	EP 157600	B1	19920701		
	R: CH, DE, FR, GB, IT, LI, NL, SE				
	US 4648913	A	19870310	US 1984-594344	19840329
	AU 8538094	A1	19851003	AU 1985-33094	19850125
	AU 573683	B2	19880616		
	CA 1228490	A1	19871027	CA 1985-475903	19850307
	NO 8501267	A	19850930	NO 1985-1267	19850328
	BR 8501422	A	19851126	BR 1985-1422	19850328
	JP 60221543	A2	19851106	JP 1985-66407	19850329
	US 4897126	A	19900130	US 1988-213722	19880630
	US 5135713	A	19920804	US 1990-588410	19900926
PRAI	US 1984-594344		19840329		
	US 1984-685731		19841224		
	US 1988-149802		19880128		
	US 1988-172506		19880324		

AB High toughness in combination with tensile strength is obtained in aircraft alloys contg. **Li** 0.5-4, **Mg** 0-5.0, **Cu** 0-5.0, **Zr** 0-1.0, **Mn** 0-2.0, **Zn** 0-7, **Fe** <0.5%, and **Si** <0.5%. The wrought

bar or strip is soln.-treated, quenched, stretched >3%, and aged at 150-400.degree.F. Tensile strength of 50-85 kpsi is typically achieved with fracture toughness 25-75 kpsi-in^{0.5}. Thus, **Al** alloy ingot contg. **Li** 1.73, **Cu** 2.63, and **Zr** 0.12% was homogenized 24 h at 1000.degree.F, and hot-rolled into plates 1 in. thick. The plate was soln. heat treated 1 h at 1025.degree.F, quenched in water at 70.degree.F, stretched 2 or 6%, and aged at 325 or 375.degree.F. Tensile strength and fracture toughness were higher after stretching to 6%, compared with 2%.

Examiner's Case

AN 124:124235 HCA
TI **Aluminum**-scandium alloys for welding rods and welded
construction
IN Tack, William Troy; Hansson, Inge L. H.
PA Ashurst Corp., USA
SO PCT Int. Appl., 139 pp
CODEN: PIXXD2

DT Patent
LA English

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9532074	A2	19951130	WO 1995-US6684	19950524
	WO 9532074	A3	19960314		
	W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
	US 5620652	A	19970415	US 1995-410801	19950327
	AU 9526515	A1	19951218	AU 1995-26515	19950524
	EP 760727	A1	19970312	EP 1995-921434	19950524
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT,				
SE	JP 10505282	T2	19980526	JP 1995-530546	19950524
	NO 9604958	A	19970114	NO 1996-4958	19961121
PRAI	US 1994-249023		19940525		
	US 1995-410801		19950327		
	WO 1995-US6684		19950524		
AB	The Ce-contg. alloys with .gt;req.60% Al are suitable for welding rods and welded construction, and typically contain Sc 0.02-10.0 (esp. 0.1-0.5) and Zr 0.05-0.22%. The welding process is suitable for manuf. of bicycle frames from tubular preforms. The typical Al alloys for structural applications contain Cu 1.5-3.1, Mg 1.0-2.1, Fe 0.5-1.7, Ni 0.6-1.5, Ti 0.04-0.10, Si 0.10-0.25, Sc 0.02-10.0, and Zr 0.1-1.0%. The Al alloys with Li typically contain Cu 3.5-5.5, Li 0.40-2.0, Ag 0.01-0.80, Mg 0.01-1.5, Sc 0.02-0.5, and Zr 0.0-1.0%. The Al alloys with Zn typically contain Zn 4.0-9.0, Mg 0.6-3.8, Cu 0.1-3.0, Sc 0.02-10.0, and optionally Zr 0.0-1.0%. The alloys are suitable for structural applications in transportation and sport-oriented equipment.				

Examiner - C 8

AN 110:235863 HCA
TI Manufacture of high-strength **aluminum** alloy without solution
treatment

IN Uno, Teruo; Hirano, Seiichi
PA Sumitomo Light Metal Industries, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF

DT Patent
LA Japanese

FAN.CNT 1
PATENT NO. KIND DATE APPLICATION NO. DATE
----- ----- ----- -----
JP 01025954 A2 19890127 JP 1987-178850 19870720

PI JP 03066387 B4 19911017

AB The **Al** alloy for aircraft is manufd. from a billet contg.
Cu 0.5-5.0, **Li** 0.5-4.0, **Mg** 0, 0.5-6.0,
optional **Cr** 0.05-0.30, **Mn** 0.05-1.0, **Zr** 0.05-0.30, and/or **V** 0.05-0.30% by
soaking at 520-550.degree. for 2-48 h, heating at 450-520.degree.,
extruding, air cooling, and artificially aging. Thus, a billet of the
Al alloy contg. **Li** 2.1, **Cu** 2.7, **Si** 0.04, **Fe**
0.05, **Ti** 0.02, **B** 0.002, and **Be** 0.0005% was soaked at 530.degree., heated
at 480.degree., extruded into a rod, cooled, and aged at 175.degree. to
show tensile strength 47.0 kg/mm², yield point 40.1 kg/mm², and
elongation
8%.

Yilmaz - 65

AN 124:295966 HCA
TI Crystallography of heterogeneous S' & T1 precipitates in double aged
Al-Cu-Mg-(Li) Alloys
AU Oezbilen, Sedat
CS Teknik Egitim Fakultesi, Gazi Univ., Ankara, Turk.
SO Turk. J. Eng. Environ. Sci. (1996), 20(2), 103-12
CODEN: TJESEC; ISSN: 1300-0160
DT Journal
LA Turkish
AB Alloys prep'd. with a chem. compn. of **Al-2.11%Cu-0.93%**
Mg (alloy-1) and **Al-2.07%Cu-0.97%Mg**
-0.87%**Li** (alloy-2) were subjected to homogenization,
water-quenching, natural aging for 3.15 .times. 107s & artificial aging
at 463K for 2.16 .times. 104s & 8.64 .times. 104s (double aging). Selected
samples were examd. in detail under TEM. For this purpose, bright & dark
field images together with electron diffraction patterns taken from
[001], [011], [012] & [111]Al-matrix directions were used. It was obsd. that
there was an effect of alloying elements, namely **Li**, **Cu**
, **Mg** on the nature & d. of lattice defects of dislocation loop
type in Al-matrix during heat treatments. In alloy-2,
Li & **Cu** atoms segregating on Frank & double-arc
contrast, prismatic loops cause the formation of T1 (Al₂CuLi) ppts.
during double aging; in alloys-1 & 2, **Cu** & **Mg** atoms
segregating on unfaulted & orthorhombic, prismatic dislocation loops
cause the formation of heterogeneous S' (Al₂CuMg) ppts. on these dislocation
loops during the same heat treatment.

Excuse me, I am

AN 124:124235 HCA
TI **Aluminum**-scandium alloys for welding rods and welded
construction
IN Tack, William Troy; Hansson, Inge L. H.
PA Ashurst Corp., USA
SO PCT Int. Appl., 139 pp
CODEN: PIXXD2

DT Patent
LA English

FAN.CNT 2

PATENT NO. KIND DATE APPLICATION NO. DATE

PI WO 9532074 A2 19951130 WO 1995-US6684 19950524
WO 9532074 A3 19960314
W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI,
GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD,
MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ,
TM, TT
RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT,
LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE,
SN, TD, TG
US 5620652 A 19970415 US 1995-410801 19950327
AU 9526515 A1 19951218 AU 1995-26515 19950524
EP 760727 A1 19970312 EP 1995-921434 19950524
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT,

SE JP 10505282 T2 19980526 JP 1995-530546 19950524
NO 9604958 A 19970114 NO 1996-4958 19961121

PRAI US 1994-249023 19940525
US 1995-410801 19950327
WO 1995-US6684 19950524

AB The Ce-contg. alloys with $\text{Ce} \geq 60\%$ **Al** are suitable for
welding rods and welded construction, and typically contain Sc 0.02-10.0
(esp. 0.1-0.5) and Zr 0.05-0.22%. The welding process is suitable for
manuf. of bicycle frames from tubular preforms. The typical **Al**
alloys for structural applications contain Cu 1.5-3.1,
Mg 1.0-2.1, Fe 0.5-1.7, Ni 0.6-1.5, Ti 0.04-0.10, Si 0.10-0.25, Sc
0.02-10.0, and Zr 0.1-1.0%. The **Al** alloys with Li
typically contain Cu 3.5-5.5, Li 0.40-2.0, Ag
0.01-0.80, Mg 0.01-1.5, Sc 0.02-0.5, and Zr 0.0-1.0%. The
Al alloys with Zn typically contain Zn 4.0-9.0, Mg
0.6-3.8, Cu 0.1-3.0, Sc 0.02-10.0, and optionally Zr 0.0-1.0%.
The alloys are suitable for structural applications in transportation and
sport-oriented equipment.

Examiner's Copy

AN 118:85846 HCA
TI **Aluminum-lithium-zinc** alloys for extruded parts having
a low aspect ratio
IN Witters, Jeffrey J.; Cheney, Brian A.; Rioja, Roberto J.
PA Aluminum Co. of America, USA
SO PCT Int. Appl., 21 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1
PATENT NO. KIND DATE APPLICATION NO. DATE
----- ----- -----
PI WO 9212269 A1 19920723 WO 1991-US9808 19911227
W: JP
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE
US 5151136 A 19920929 US 1990-634901 19901227
EP 517884 A1 19921216 EP 1992-902697 19911227
R: DE, FR, GB
JP 05505854 T2 19930826 JP 1992-502886 19911227
PRAI US 1990-634901 19901227
WO 1991-US9808 19911227
AB The **Al** alloys having extruded length/thickness ratio of 1-2.5
contain **Li** 0.2-5.0 and **Zn** 0.05-12.0 (esp. 0.05-1%) with
Mg 0-5.0, **Cu** .1toreq.6.5, **Zr** .1toreq.1.0 **Mn** .1toreq.2.0,
Ag .1toreq.2, **Fe** .1toreq.0.5, and/or **Si** .1toreq.0.5%. The preferred
alloy contains **Li** 1.5-3.0, **Cu** 2.55-2.90, **Mg**
0.2-2.5, **Zn** 0.2-11.0, **Zr** 0.08-0.12, **Mn** 0-1.0, and **Fe** and **Si** impurities
.1toreq.0.1% each. The alloys optionally contain **Cr**, **V**, **Sc**, and/or **Ti** at
0.05-0.2, and/or **Hf**, **Fe**, **Ni**, **Ag**, and/or **Mn** at 0.05-0.6%. The starting
alloy ingot can be preformed with .gtoreq.30% size redn., followed by
heat treatment for 1-50 h at 400-1200.degree. prior to the extrusion stage.
Tensile yield strength of the extrusions is .gtoreq.60 kpsi. Thus, the
extruded billet was manufd. from the alloy contg. **Li** 2.17,
Cu 2.79, **Zn** 0.49, **Mg** 0.25, **Zr** 0.07, **Mn** 0.35, and **V**
0.08%. After thermomech. treatment and final aging (30 h at 310
.degree.F), tensile strength was 78 kpsi, yield point 71.2 kpsi, and
elongation 6.8%. Com. AA 2091 **Al** alloy after the same
processing showed 70 kpsi, 69.4 kpsi, and 1.6% resp.

Examiner's Copy

AN 90:126079 HCA
TI **Aluminum** alloy with improved weldability
IN Sperry, Philip R.; Mandigo, Frank N.
PA Swiss Aluminium Ltd., Switz.
SO Ger. Offen., 17 pp.
CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 2810932	A1	19781012	DE 1978-2810932	19780314
	US 4094705	A	19780613	US 1977-781718	19770328

PRAI US 1977-781718 19770328
AB High-strength formable **Al** alloy [69508-78-7] suitable
for resistance welding contains **Mg** 2-4, **Li** 0.4-0.8, **Mn**
0.1-0.7, **Fe** .1toreq.0.45, **Si** .1toreq.0.45, **Cu** .1toreq.10.2, **Cr**
.1toreq.0.4, **Ti** 0.1-0.2, **Zn** .1toreq.0.3, **Ni** .1toreq.0.3, **V** 0.05-0.15 and
Zr .1toreq.0.15%. The alloy contains **Li** in solid soln. and
shows higher elec. resistance than **Li**-free alloys when rolled to
sheet and annealed.

Examiner's C.R.

AN 110:235863 HCA
TI Manufacture of high-strength **aluminum** alloy without solution treatment

IN Uno, Teruo; Hirano, Seiichi
PA Sumitomo Light Metal Industries, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 01025954	A2	19890127	JP 1987-178850	19870720
	JP 03066387	B4	19911017		

AB The **Al** alloy for aircraft is manufd. from a billet contg. **Cu** 0.5-5.0, **Li** 0.5-4.0, **Mg** 0, 0.5-6.0, optional **Cr** 0.05-0.30, **Mn** 0.05-1.0, **Zr** 0.05-0.30, and/or **V** 0.05-0.30% by soaking at 520-550.degree. for 2-48 h, heating at 450-520.degree., extruding, air cooling, and artificially aging. Thus, a billet of the **Al** alloy contg. **Li** 2.1, **Cu** 2.7, **Si** 0.04, **Fe** 0.05, **Ti** 0.02, **B** 0.002, and **Be** 0.0005% was soaked at 530.degree., heated to 480.degree., extruded into a rod, cooled, and aged at 175.degree. to show tensile strength 47.0 kg/mm², yield point 40.1 kg/mm², and elongation 8%.

(ow) (Jy)